

Simplify  $\frac{(5-2)^2}{3} + 2^3 \div 4$

$$\frac{\frac{9}{3} + 8 \div 4}{3 + 8 \div 4}$$

$$\left[ \left( \frac{d^2 f^3 g^{-4}}{d^5 f^8 g} \right)^{-4} \left( \frac{d^2}{g^{10}} \right)^4 \right]^{3+2} = \left( \frac{d^3 f^5 g^5}{d^{12} f^{20} g^{20} d^8} \right)^4 \frac{d^8}{g^{40}} = \frac{d^8}{g^{20} f^{20}}$$

3 + 2  
5

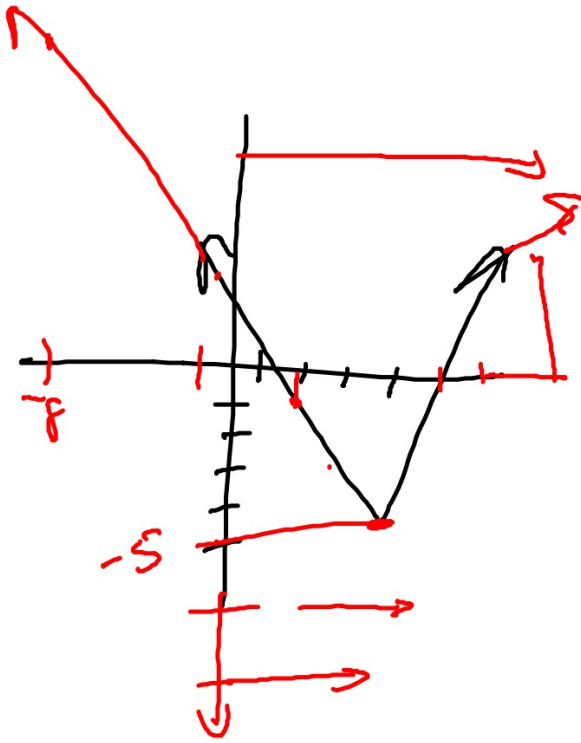
$$216^{-\frac{2}{3}}$$

$$\left(\frac{1}{216}\right)^{\frac{2}{3}}$$

$$\left(\frac{1}{\sqrt[3]{216}}\right)^2$$

$$\left(\frac{1}{6}\right)^2 = \frac{1}{36}$$

$1^3 = 1$
$2^3 = 8$
$3^3 = 27$
$4^3 = 64$



$$D: (-\infty, \infty)$$

$$R: [-5, \infty)$$

$$f(x) = x^2 - 4x \quad g(x) = x + 8$$

$$f + g = (x^2 - 4x) + (x + 8)$$
$$x^2 - 4x + x + 8 = \underline{x^2 - 3x + 8}$$

$$g - f = (x + 8) - (x^2 - 4x)$$

$$x + 8 - x^2 + 4x$$
$$\underline{-x^2 + 5x + 8}$$

$$f(x) = x^2 - 4x \quad g(x) = x + 8$$

$$f(g(x))$$

$$f(\underline{x+8})$$

$$(x+8)^2 - 4(x+8)$$

$$(\underline{x+8})(\underline{x+8}) - 4x - 32$$

$$x^2 + \underline{8x} + \underline{8x} + 64 - \underline{4x} - 32$$

$$x^2 + 12x + 32$$

$$g(f(x))$$

$$g(\underline{x^2 - 4x})$$

$$(\underline{x^2 - 4x}) + 8$$

$$\underline{x^2 - 4x + 8}$$

$$f(x) = \frac{1}{4}x + 6$$

$$y = \frac{1}{4}x + 6$$

$$x = \frac{1}{4}y + 6$$

$$4(x - 6) = \left(\frac{1}{4}y\right)4$$

$$4x - 24 = y$$

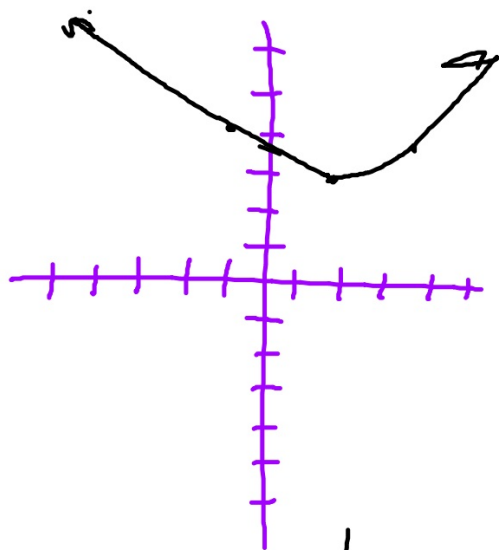
① Replace  $f(x)$  with  $y$

② Switch  $x$  and  $y$

③ Solve for  $y$

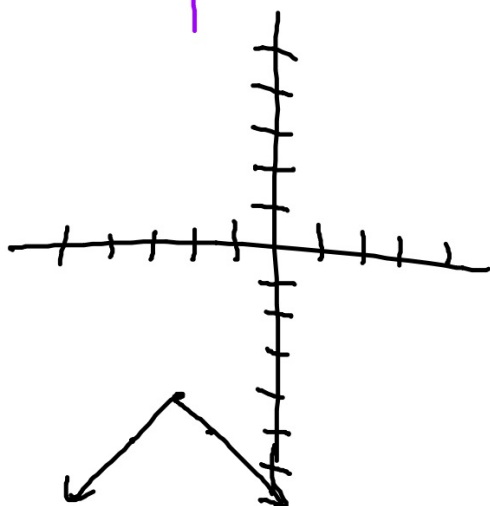
④ Replace  $y$  with  $f^{-1}(x)$

$$f^{-1}(x) = 4x - 24$$



$$f(x) = \frac{\text{up}}{\text{over}} \frac{1}{2} |x - 2| + 3$$

(2, 3)



$$f(x) = -|x + 2| - 4$$

(-2, -4)

$\frac{-1}{1} = \text{"slope"}$

$$f(x) = 3|x+2| - 3$$

Vertical stretch by a factor of 3  
Shift left 2 units  
Shift down 3 units



$$f(x) = -|x| + 5$$

reflects over x axis  
(reflection over x axis)

Shift up 5 units.

$$f(x) = \frac{1}{2}|x-3| + 5$$

Vertically compressed by a  
factor of  $\frac{1}{2}$

Shift right 3 units

Shift up 5 units

the graph of  $f(x) = |x|$  translated  
6 units to the right and  
10 units down and reflected  
over x axis

$$f(x) = -|x - 6| - 10$$

$$f(x) = -|x|$$

Find the equation of the line that  
passes through  $(5, -2)$   
 $(6, -5)$

$$\frac{y_2 - y_1}{x_2 - x_1} = m$$

$$y - y_1 = m(x - x_1)$$